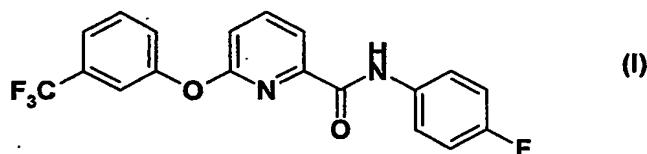


We claim:

1. A synergistic herbicidal mixture comprising

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A) picolinafen (I)

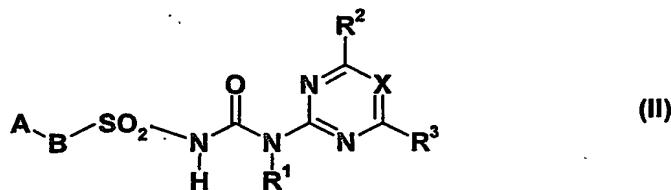


10 or one of its environmentally compatible salts;

and

B) a synergistically effective amount of at least a sulfonylurea of formula II

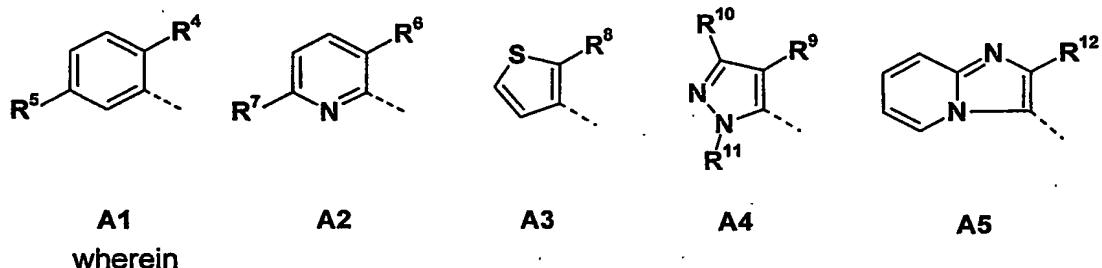
15



wherein

20

A is A1, A2, A3, A4 or A5



25

R⁴ is halogen, C₁-C₄-haloalkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₂-alkoxy-C₁-C₄-alkoxy, cyclopropylcarbonyl, di(C₁-C₄-alkyl)-aminocarbonyl or hydroxycarbonyl;

R⁵ is hydrogen, halogen or C₁-C₄-alkylsulfonylamino-C₁-C₄-alkyl;

5 R⁶ is hydroxycarbonyl or C₁-C₄-alkylsulfonyl;

10 R⁷ is hydrogen or C₁-C₄-haloalkyl;

15 R⁸ is hydroxycarbonyl;

20 R⁹ is 2-methyl-tetrazol-5-yl or hydroxycarbonyl;

25 R¹⁰ is hydrogen or halogen;

30 R¹¹ is C₁-C₄-alkyl;

35 R¹² is halogen or C₁-C₄-alkylsulfonyl;

40 B is -O-, -NH-, -CH₂- or a bond;

45 R¹ is hydrogen or C₁-C₄-alkyl;

50 R² is halogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylamino or di(C₁-C₄-alkyl)amino;

55 R³ is C₁-C₄-alkyl, C₁-C₄-haloalkoxy or C₁-C₄-alkoxy;

60 X is CH or N;

65 or one of its environmentally compatible salts or esters;

70 and, if desired,

75 C) at least a safener selected from the group of dichlormid, benoxacor, LAB 145 138, MG-191, furilazole, cyometrinil, oxabetrinil, fluxofenim, flurazole, naphthalic acid anhydride, fenclorim, fenchlorazole-ethyl, mefenpyr, isoxadifen, cloquintocet, 1-ethyl-4-hydroxy-3(1H-tetrazol-5-yl)-1H-quinolin-2-one, 4-carboxymethyl-chroman-4-carboxylic acid, N-(2-methoxybenzyl)-4-(3-methylureido)-benzenesulfonamide and (3-oxo-isothio-chroman-4-yldenmethoxy)acetic acid methyl ester;

80 or one of its environmentally compatible salts, esters or amides.

2. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component
B) at least a sulfonylurea of formula II, wherein

A is A1, wherein

5

R^4 is halogen, C_1 - C_3 -haloalkyl, C_1 - C_2 -alkoxy, C_1 - C_2 -halo-alkoxy, C_1 - C_2 -alkoxy- C_1 - C_2 -alkoxy cyclopropylcarbonyl, di(C_1 - C_2 -alkyl)amino-carbonyl, hydroxycarbonyl or methoxycarbonyl, ethoxycarbonyl or oxetan-3-yloxy carbonyl;

10

R^5 is hydrogen, halogen, or C_1 - C_2 -alkylsulfonylamino- C_1 - C_2 -alkyl;

R^1 is hydrogen; or C_1 - C_2 -alkyl;

15

R^2 is halogen, C_1 - C_2 -alkyl, C_1 - C_2 -haloalkyl, C_1 - C_2 -alkoxy, C_1 - C_2 -haloalkoxy, C_1 - C_2 -alkylamino, or di(C_1 - C_2 -alkyl)-amino;

R^3 is C_1 - C_2 -alkyl, C_1 - C_3 -alkoxy, or C_1 - C_2 -haloalkoxy;

20

X is CH or N;

or one of its environmentally compatible salts;

3. A synergistic herbicidal mixture as claimed in claim 1 comprising, as a component
25 B) at least a sulfonylurea of formula II, wherein

A is A2, wherein

30

R^6 is C_1 - C_2 -alkylsulfonyl, hydroxycarbonyl or methoxycarbonyl;

R^7 is hydrogen or C_1 - C_2 -haloalkyl;

B is a bond;

35

R^1 is hydrogen;

R^2 is C_1 - C_2 -alkoxy;

R^3 is C_1 - C_2 -alkoxy;

40

X is CH;

or one of its environmentally compatible salts;

4. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component
5 B) at least a sulfonylurea of formula II wherein

A is A3, wherein

10 R⁸ is hydroxycarbonyl or methoxycarbonyl;

B is a bond;

15 R¹ is hydrogen;

20 R² is C₁-C₂-alkyl;

R³ is C₁-C₂-alkoxy;

X is CH;

20 or one of its environmentally compatible salts.

5. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component
25 B) at least a sulfonylurea of formula II wherein

A is A4, wherein

30 R⁹ is 2-methyl-tetrazol-5-yl, hydroxycarbonyl, methoxycarbonyl or ethoxycarbonyl;

R¹⁰ is hydrogen, or halogen;

R¹¹ is C₁-C₂-alkyl;

35 B is a bond;

R¹ is hydrogen;

40 R² is C₁-C₂-alkoxy;

R³ is C₁-C₂-alkoxy;

X is CH;

or one of its environmentally compatible salts.

5

6. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component B) at least a sulfonylurea of formula II wherein

A is A5, wherein

10

R¹² is halogen, preferably chlorine; or C₁-C₂-alkyl-sulfonyl;

B is a bond;

15

R¹ is hydrogen;

R² is C₁-C₂-alkoxy;

R³ is C₁-C₂-alkoxy;

20

X is CH;

or one of its environmentally compatible salts.

25

7. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component B) at least a sulfonylurea selected from the group of azimsulfuron, bensulfuron, chlorimuron, chlorsulfuron, cinosulfuron, cyclosulfamuron, ethametsulfuron, ethoxysulfuron, flazasulfuron, flupyrulfuron, halosulfuron, imazosulfuron, iodosulfuron, mesosulfuron, metsulfuron, nicosulfuron, primisulfuron, prosulfuron, pyrazosulfuron, rimsulfuron, sulfometuron, sulfosulfuron, thifensulfuron, triasulfuron, tribenuron, triflusulfuron, trifloxysulfuron or tritosulfuron, or its environmentally compatible salts or esters.

30

35

8. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component B) at least a sulfonylurea selected from the group of azimsulfuron, bensulfuron, chlorimuron, chlorsulfuron, cyclosulfamuron, ethametsulfuron, ethoxysulfuron, flazasulfuron, flupyrulfuron, halosulfuron, imazosulfuron, metsulfuron, nicosulfuron, primisulfuron, prosulfuron, pyrazosulfuron, rimsulfuron, sulfometuron, sulfosulfuron, thifensulfuron, triasulfuron, tribenuron, triflusulfuron, trifloxysulfuron or tritosulfuron, or its environmentally compatible salts or esters.

40

9. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component B) at least a sulfonylurea selected from the group of azimsulfuron, bensulfuron, chlorimuron, chlorsulfuron, cyclosulfamuron, ethametsulfuron, ethoxysulfuron, flazasulfuron, halosulfuron, imazosulfuron, nicosulfuron, primisulfuron, prosulfuron, pyrazosulfuron, rimsulfuron, sulfometuron, triasulfuron or triflusulfuron, or its 5 environmentally compatible salts or esters.
10. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component B) at least a sulfonylurea selected from the group of chlorsulfuron, flupyrifluron, iodosulfuron, mesosulfuron, metsulfuron, prosulfuron, sulfosulfuron, thifensulfuron, triasulfuron, tribenuron, or tritosulfuron, or its 10 environmentally compatible salts or esters.
11. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component B) at least a sulfonylurea selected from the group of chlorsulfuron, flupyrifluron, metsulfuron, prosulfuron, sulfosulfuron, thifensulfuron, triasulfuron, tribenuron, or 15 tritosulfuron, or its environmentally compatible salts or esters.
12. A synergistic herbicidal mixture as claimed in claim 1 comprising, as component B) at least a sulfonylurea selected from the group of chlorsulfuron, prosulfuron or 20 triasulfuron, or its environmentally compatible salts or esters.
13. A synergistic herbicidal mixture as claimed in any of claims 1 to 12 comprising, as a component C) at least cloquintocet, isoxadifen or mefenpyr; 25
14. A synergistic herbicidal mixture as claimed in any of claims 1 to 13 comprising, additionally as component D) at least an acetyl-CoA carboxylase inhibitor (ACC), acetolactate synthase inhibitor (ALS), amide, auxin herbicide, auxin transport inhibitor, carotenoid biosynthesis inhibitor, enolpyruvylshikimate 3-phosphate synthase inhibitor (EPSPS), glutamine synthetase inhibitor, lipid biosynthesis inhibitor, mitosis inhibitor, protoporphyrinogen IX oxidase inhibitor, photosynthesis inhibitor, synergist, growth substance, cell wall biosynthesis inhibitor or another herbicide. 30
- 35 15. A synergistic herbicidal mixture as claimed in any of claims 1 to 14 comprising, as active ingredients only picolinafen and one compound of group B).
16. A synergistic herbicidal mixture as claimed in any of claims 1 to 14 comprising, as active ingredients only picolinafen, one compound of group B) and one compound of group C). 40

17. A synergistic herbicidal mixture as claimed in any of claims 1 to 16 wherein the ratios of the compounds of the groups A) and B) range from 1:0.0002 to 1:50.
- 5 18. A synergistic herbicidal mixture as claimed in any of claims 1 to 14 or 16 wherein the ratios of the compounds of the groups A) and C) range from 1:0.0002 to 1:50.
- 10 19. A herbicidal composition comprising a herbicidally active amount of a synergistic herbicidal mixture as claimed in any of claims 1 to 18, at least one liquid and/or solid carrier and, if desired, at least one surfactant.
- 15 20. A process for the preparation of a herbicidal composition as claimed in claim 18, wherein the compounds of group A), B), if desired, C), if desired, D), at least one liquid and/or solid carrier and, if desired, at least one surfactant are mixed.
- 20 21. A method for controlling undesired vegetation, which comprises applying a synergistic herbicidal mixture as claimed in any of claims 1 to 18, during and/or after the emergence of undesired plants, it being possible for the active compounds of the groups A), B), if desired, C) and, if desired D) to be applied simultaneously or in succession.